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APR 10 1969

CURRENT SERIAL RECORDS

# **WATER SUPPLY OUTLOOK FOR ARIZONA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,  
SALT RIVER VALLEY WATER USERS ASSOCIATION  
and  
ARIZONA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies  
named above in cooperation with the Federal, State and pri-  
vate organizations listed on the last page of this report.

AS OF  
APR. 1, 1969

## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

## PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80521
Idaho	P. O. Box 38, Boise, Idaho 83707
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82602

## PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



# **WATER SUPPLY OUTLOOK FOR ARIZONA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

*Issued by*

KENNETH E. GRANT  
ADMINISTRATOR  
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SALT RIVER VALLEY WATER  
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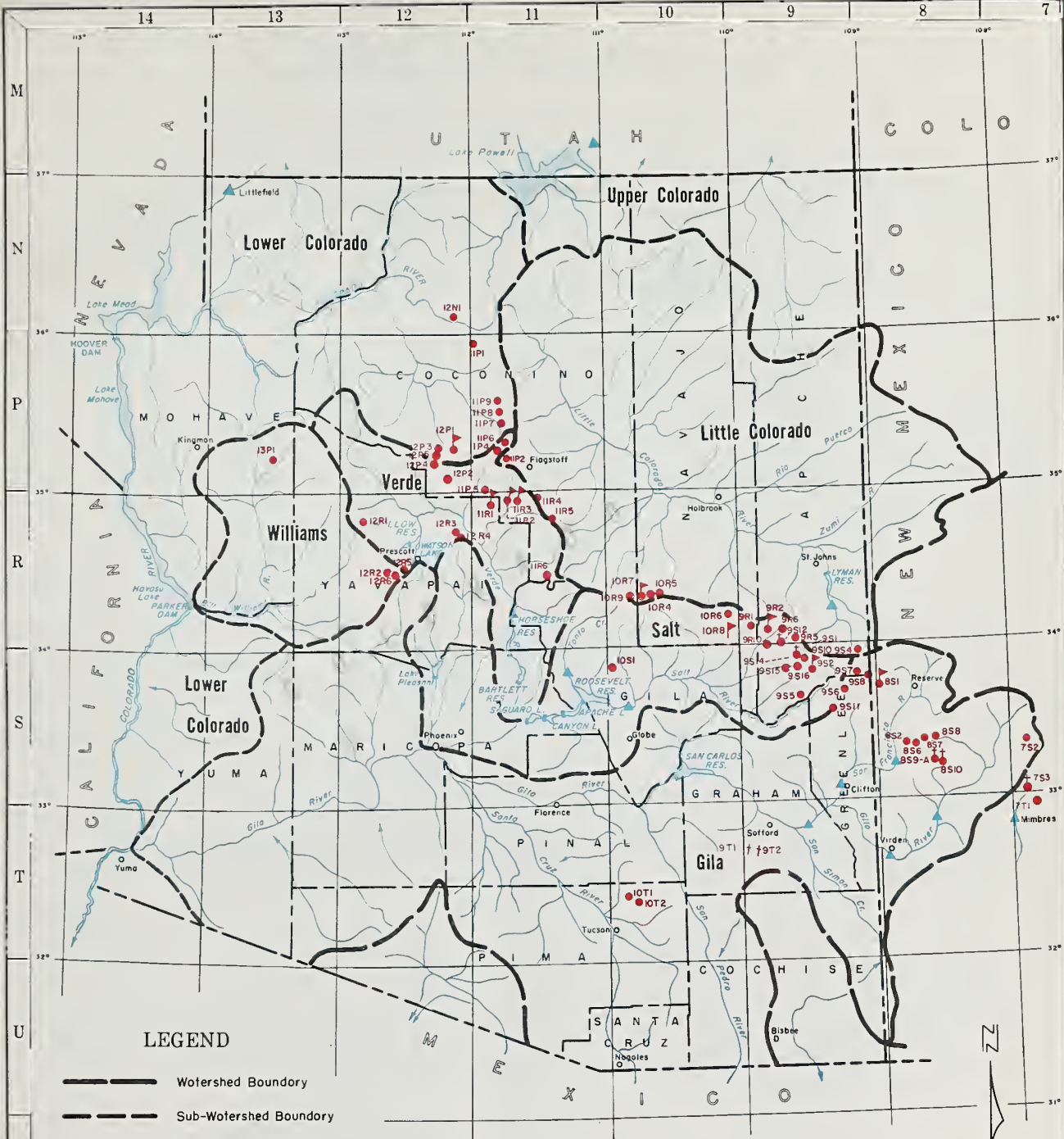
*Report prepared by*

RICHARD W. ENZ, Snow Survey Supervisor

SOIL CONSERVATION SERVICE  
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# **ARIZONA** **COOPERATIVE SNOW SURVEYS** Snow Courses and Sub-Watersheds

# INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

Number	Name	Sec	Twp	Rge	Elevation	River Basin
11R6	Baker Butte (p)	4	12N	9E	7300	Verde
9S1-A	Baldy (p)	28	7N	27E	9125	Little Colorado
9S15	Baldy #2	12	6N	26E	10000	Little Colorado
9S16	Baldy #3	13	6N	26E	11000	Little Colorado
10T1	Bear Wallow	6	12S	16E	8100	Gila
12P5	Bill Williams Intermediate	17	21N	2E	8550	Lower Colorado
12P4	Bill Williams Summit	17	21N	2E	8950	Lower Colorado
9S6	Beaver Head	13	4N	30E	8000	San Francisco
9S10-*	Black River Divide	10	6N	27E	9400	Salt
12N1	Bright Angel	34	33N	3E	8400	Lower Colorado
12R1	Camp Wood	3	16N	6W	5700	Verde
10R7-M	Canyon Creek #2	18	11N	15E	7500	Little Colorado
10R9	Canyon Point (p)	28	11N	14E	7600	Salt
11R2-M	Casner Park	19	18N	8E	6930	Verde
12P1-M	Chalender	27	22N	3E	7100	Verde
12R6	Copper Basin Divide (p)	23	13N	3W	6720	Verde
10R8-*	Corduroy Creek	4	8N	21E	6000	Salt
9S7	Coronado Trail	26	5N	30E	8000	San Francisco
9T2-A	Crazy Horse	34	8S	24E	10200	Gila
7T1	Emory Pass #1	16	16S	9W**	7800	Mimbres
7T2	Emory Pass #2	16	16S	9W**	7800	Mimbres
10R6	Forest Dale	2	9N	21E	6430	Salt
11P2	Fort Valley (p)	22	22N	6E	7350	Little Colorado
9R5	Ft. Apache	18	7N	27E	9160	Little Colorado
8S1-M	Frisco Divide	31	6S	20W**	8000	San Francisco
12R4	Gaddes Canyon	11	15N	2E	7600	Verde
10R5	Gentry	36	11N	15E	7650	Salt
11P1	Grand Canyon	21	30N	4E	7500	Lower Colorado
9S11	Hannagan Meadows (p)	19	3N	29E	9090	Salt
11R5	Happy Jack	30	17N	9E	7630	Verde
9R10	Hawley Lake	13	7N	24E	8300	Salt
10R4	Heber (p)	28	11N	15E	7600	Little Colorado
9T1-A	High Peak	34	8S	24E	10500	Gila
8S9-A	Hummingbird	19	11S	17W**	10550	San Francisco
8S6	Ice King	6	11S	18W**	8020	San Francisco
7S2	Inman	6	11S	10W**	7800	Gila
11P9	Inner Basin #1 (p)	28	23N	7E	10000	Little Colorado
11P8	Inner Basin #2 (p)	28	23N	7E	9750	Little Colorado
11P7	Inner Basin #3	3	23N	7E	10250	Little Colorado
12R2	Iron Springs	22	14N	3W	6200	Bill Williams
9S2-A	Maverick Fork (p)	13	6N	27E	9150	Salt
7S3-A	McKnight Cabin	10	15S	10W**	9300	Mimbres
9R2-M	McNary	23	8N	23E	7200	Salt
9R1	Milk Ranch	33	8N	23E	7000	Salt
12R3	Mingus Mountain	3	15N	2E	7100	Verde
8S2	Mogollon	2	11S	19W**	7000	San Francisco
11R4	Mormon Lake	13	18N	8E	7350	Little Colorado
11R3-M-A	Mormon Mountain (p)	14	18N	8E	7500	Verde
9S12-A	Mt. Ord	4	6N	26E	11000	Salt
11R1-M	Munds Park	15	18N	7E	6500	Verde
11P5-M	Newman Park	25	19N	6E	6750	Verde
9S4	Nutriso	23	6N	30E	8500	San Francisco
9S5	Pacheta	27	4-1/2N	27E	7800	Salt
8S7	Redstone Trail	5	11S	18W**	8600	San Francisco
10T2	Rose Canyon	15	12S	16E	7300	Gila
8S8	Silver Creek Divide	4	11S	18W**	9000	San Francisco
9S14-A	Smith Cienega	10	6N	26E	9850	Salt
11P4	Snow Bowl #1 (p)	36	23N	6E	10260	Verde
11P6	Snow Bowl #2	31	23N	7E	11000	Verde
9S8	State Line	6	6S	21W**	8000	San Francisco
12R5	White Spar	19	13N	2W	6000	Verde
12P2	White Horse Lake Jct	2	20N	2E	7150	Verde
8S10-A	Whitewater	19	11S	17W**	10750	Gila
12P3	Williams Ski Run	9	21N	2E	7720	Lower Colorado
13P1	Willow Ranch	16	21N	11W	5000	Bill Williams
9R6	Wilson Lake (p)	4	7N	26E	9000	Salt
10S1	Workman Creek	33	6N	14E	6900	Salt

M SOIL MOISTURE STA.

(p) STORAGE GAGE

A

AERIAL SNOW DEPTH MARKER

\* SOIL MOISTURE STA. ONLY

\*\* NM PRINCIPAL MERIDIAN



# ARIZONA WATER SUPPLY OUTLOOK

APRIL 1, 1969

\* \* \* \* \*  
\* Below normal precipitation since March 15 has caused a slight \*  
\* reduction in streamflow forecasts. Water supplies will be good in \*  
\* all areas of Arizona except along the Upper Gila. \*  
\* \* \* \* \*

## SNOW COVER

Since March 15 snow cover declined at a greater than normal rate at the lower elevations due to the warm temperatures and lack of precipitation. It is still much above normal, however. At 11,000' in the White Mts. and on the San Francisco Peaks there is 7 to 8' of snow containing 3' of water. There has been virtually no melting at this elevation, as evidenced by the dry soil under the snow.

## PRECIPITATION

Since the middle of March there has been no significant precipitation. Some stations on the Salt and Verde Watersheds, however, received above normal amounts for the month, due to the early March storms.

## SOIL MOISTURE

Soils are above field capacity at the intermediate elevations on the Salt and Verde Watersheds. Below 6000' the soils are drying out and above 9000' they have not yet become wet. Soil moisture on the Gila Watershed is generally low except for a small area at the higher elevations.

## RESERVOIR STORAGE

March runoff has increased storage in the Salt River Project reservoirs to 89% of capacity, 62% above the 1953-67 15-year average. Storage in San Carlos is 4 times average, but only 45% of capacity. Lake Pleasant is 3/4 full with 2½ times the average amount of water in storage for this date.

## STREAMFLOW AND WATER SUPPLY

Total spring runoff (Jan.-May) into the Salt River Project System is expected to be 800,000 ac-ft. This is 62% above average, but is still only 2/3 as much as received last year. The April-May runoff forecast is just about equal to the unfilled capacity of the reservoirs, but normal use will offset inflow so the reservoirs are not expected to exceed 95% of capacity. Nevertheless, this is an excellent water supply and good carryover storage is assured for next year.

On the Gila Watershed, however, the total spring runoff is expected to be only 58% of average. Water will be short along the Upper Gila and considerable pumping will be required.

THIS IS THE FINAL REPORT FOR THIS SEASON.

THE UNIVERSITY OF CHICAGO  
DIVISION OF THE PHYSICAL SCIENCES  
DEPARTMENT OF CHEMISTRY  
JANUARY 1954  
MEMORANDUM FOR THE RECORD  
SUBJECT: [Illegible]  
[Illegible text follows, consisting of several paragraphs of faint, mostly illegible handwriting. The text appears to be a technical report or memorandum, possibly related to chemical analysis or experimental results. Key words like "analysis", "results", and "conclusion" are faintly visible but cannot be transcribed accurately.]

# STREAMFLOW FORECASTS - APRIL 1, 1969

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

SUB-WATERSHED, STREAM and STATION	SEASONAL STREAMFLOW IN THOUSANDS OF ACRE FEET					
	FORECAST PERIOD:			APRIL-MAY, INCLUSIVE		
	Forecast	Percent	Measured Runoff		1953-67	
	Runoff	15-Year	1968	1967	1966	Average
	1969	Average				
<u>SALT RIVER DRAINAGE</u>						
Salt nr. Roosevelt	200	164	245.1	28.7	202.6	121.7
Tonto Creek nr. Roosevelt	6	78	12.2	2.3	5.5	7.7
Verde River above Horseshoe	55	110	52.5	26.0	26.7	50.1
<u>GILA RIVER DRAINAGE</u>						
Gila River nr. Gila	14	83	52.6	6.5	33.7	16.8
Gila River nr. Solomon	26	75	139.0	8.2	79.0	34.6
Gila River nr. Virden	13	75	76.4	5.6	39.7	17.4
Frisco River at Clifton	15	79	65.7	4.9	37.7	18.9
Frisco River at Glenwood	7	86	36.1	2.0	18.5	8.1
<u>MIMBRES RIVER DRAINAGE</u>						
Mimbres River nr. Mimbres	.7	54	----	0.4	2.7	1.3
<u>COLORADO RIVER DRAINAGE</u>						
Little Colo. River above Lyman Dam (APRIL-JUNE, Incl)	8.5	140	18.4	0.2	13.9	6.1
Colo. River -- Lake Powell* Inflow (APRIL-JULY, Incl)	8,970	137	7247.0	6045.0	4600.0	6527.0
<u>VIRGIN RIVER DRAINAGE</u>						
Virgin River nr. Littlefield (APRIL-JUNE, Incl.)	160	480	36.2	39.0	26.4	33.5
<u>GRANITE CREEK DRAINAGE</u>						
Granite Creek	.5	---	----	----	----	----
Willow Creek	.2	---	----	----	----	----

Gila River near Solomon is forecast to remain above 100 cfs until April 20.

\* Forecast issued by Soil Conservation Service, Salt Lake City, Utah.



1969  
SEASONAL RUNOFF

STREAM AND STATION	Measured <sup>1/</sup> Runoff	Forecast Runoff	Total -	January thru May	
	Jan. - March	April - May	1969	15-Year Average	% of Average
Salt River at Intake	183.2	200	383.2	281.0	136
Verde River above Horseshoe	290.3	55	345.3	171.8	202
Tonto Creek above Roosevelt	67.9	6	73.9	42.6	173
Gila River nr. Virden	21.5	13	34.5	59.3	58
Gila River nr. Solomon	37.0	26	63.0	119.6	53
Frisco River at Clifton	18.1	15	33.1	59.8	55

<sup>1/</sup> Provisional streamflow data supplied by Salt River Project and  
U. S. Geological Survey.





STATUS OF ARIZONA RESERVOIR STORAGE - ABOUT APRIL 1, 1969

SUB- WATERSHED and/or STREAM	RESERVOIR	USABLE	USABLE STORAGE - 1000s ACRE FEET			
		CAPACITY 1000s ACRE FEET	1969	1968	1967	15-Year Average 1953-67
<u>GILA RIVER DRAINAGE</u>						
Agua Fria	Lake Pleasant	157.6	113.6	156.9	121.7	44.1
Granite	Watson Lake	4.7	4.7	4.7	3.4	----
Granite	Willow Creek	6.1	3.4	5.4	3.7	----
Gila	San Carlos	984.9	443.2	635.5	275.3	118.2
Verde (2)	Bartlett & Horseshoe	317.7	252.7	309.4	154.3	131.0
Salt (4)	Roosevelt, Apache, Canyon & Saguaro	1,755.0	1,584.5	1,718.0	1,435.7	1,002.5
<u>COLORADO RIVER DRAINAGE</u>						
Colorado	Lake Havasu	619.4	553.5	554.8	553.1	554.5
Colorado	Lake Mohave	1,810.0	1,652.5	1,669.0	1,677.0	1,695.9
Colorado	Lake Mead	26,159.0	15,386.0	14,640.0	15,438.0	16,072.4
Colorado	Lake Powell	25,002.0	9,390.0	7,850.0	7,368.0	----
Little Colorado	Lyman	30.6	19.3	21.8	17.8	10.8
Little Colorado	Show Low Lake	5.1	2.5	5.1	0.5	2.3*

\* Average is for less than 15 years of record in the 1953-67 period.

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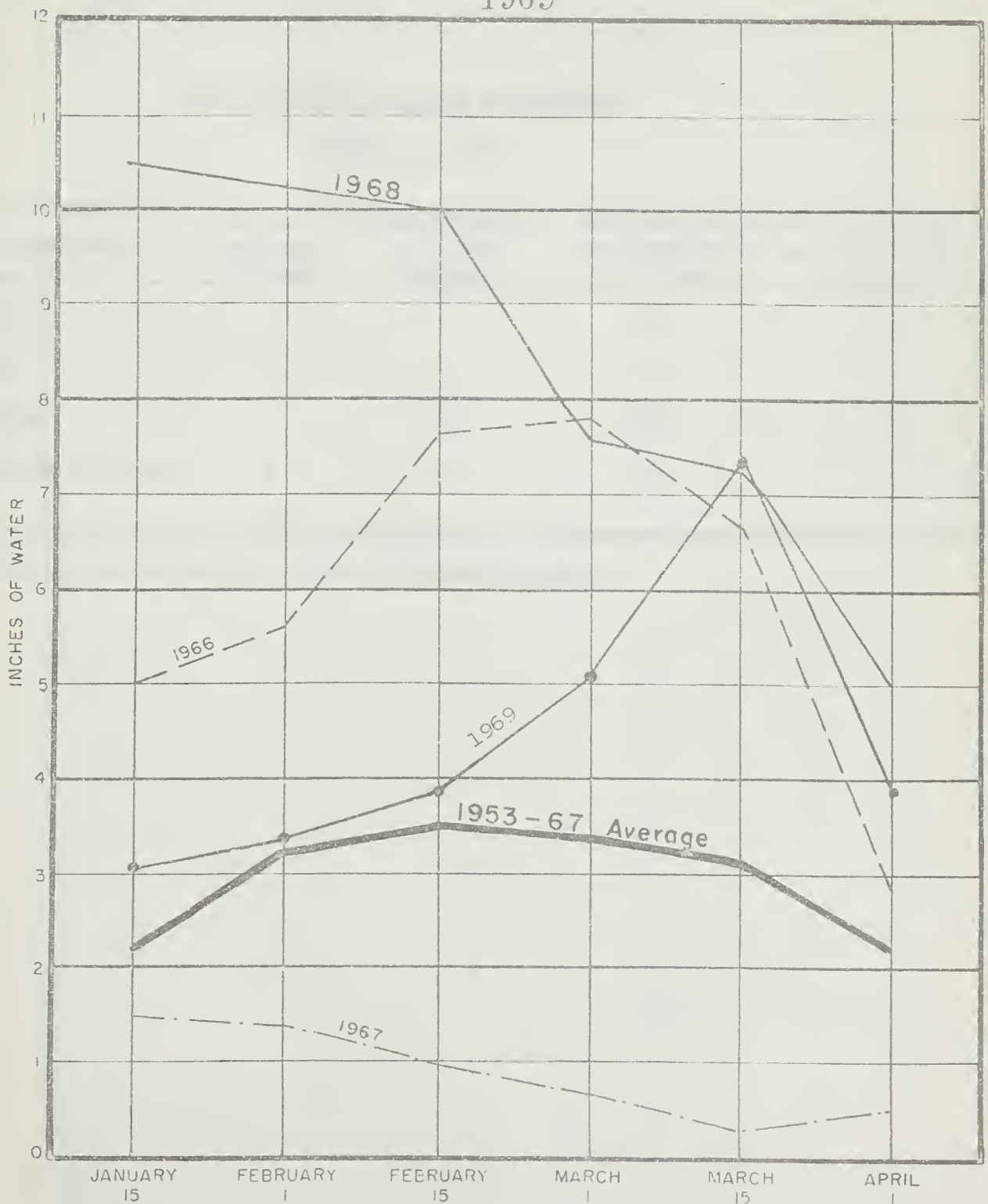
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# RELATIVE SNOW WATER ACCUMULATION ARIZONA 1969



*This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.*

# THEORY OF THE EARTH'S CRUST BY JOHN H. VAN DER GRAAF





SNOW COVER ON ARIZONA WATERSHEDS

APRIL 1, 1969

Watershed	No. of Courses Average	Water Content of Snow (Inches)	This Year's Water Content of Snow Expressed as Percent of: Last Year	Content of Percent of: Average *
Gila	6	1.3	32	345
Salt	9	5.3	69	213
Verde	7	4.4	237	334
Little Colorado	4	5.4	83	178

\* Actual or Estimated 1953-67, 15-year Average.

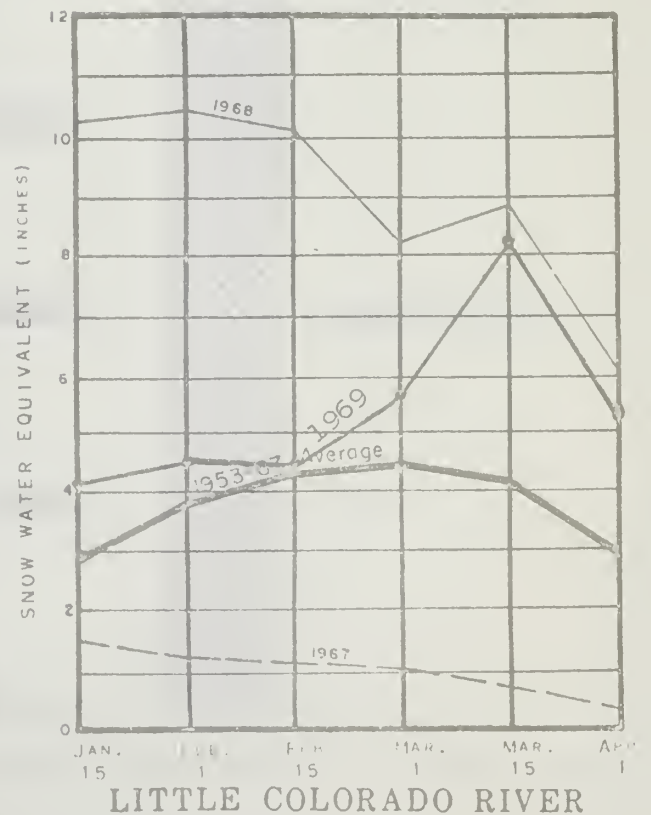
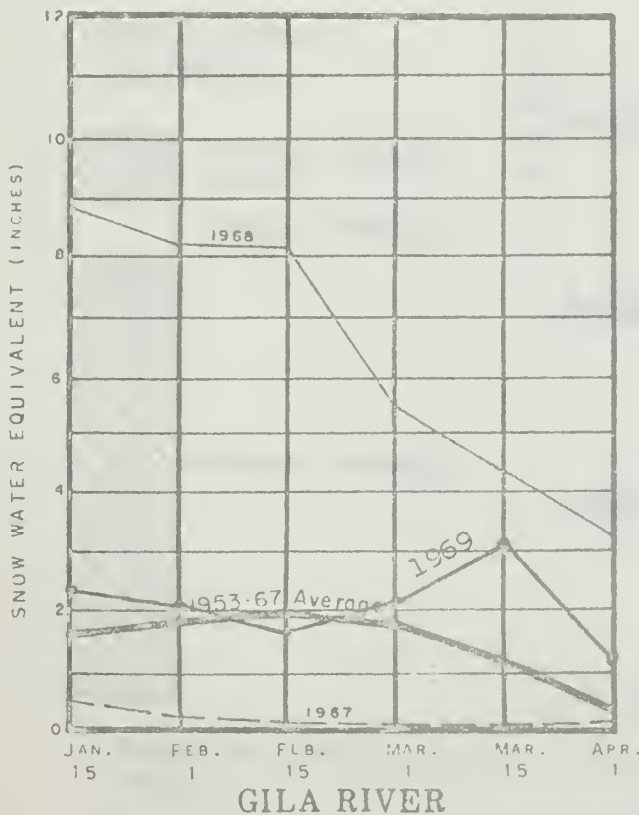
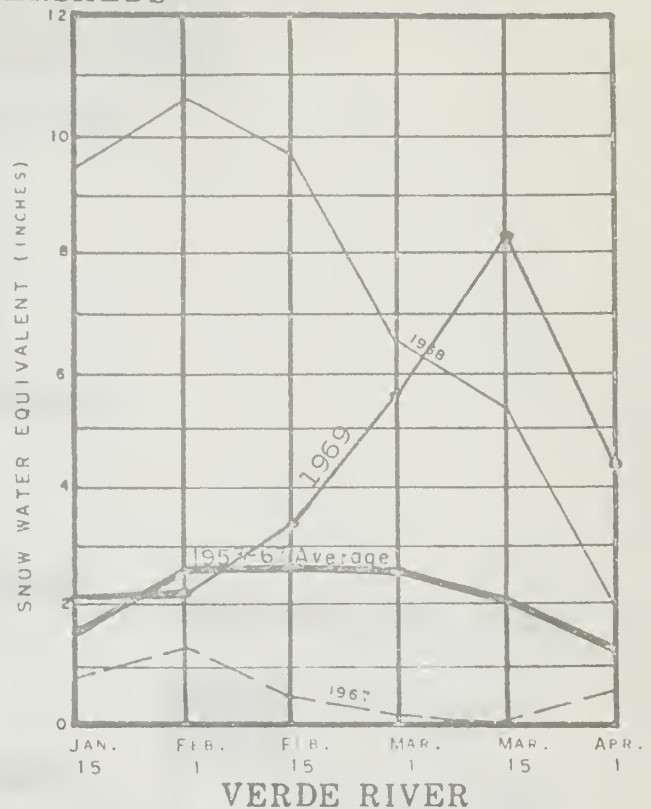
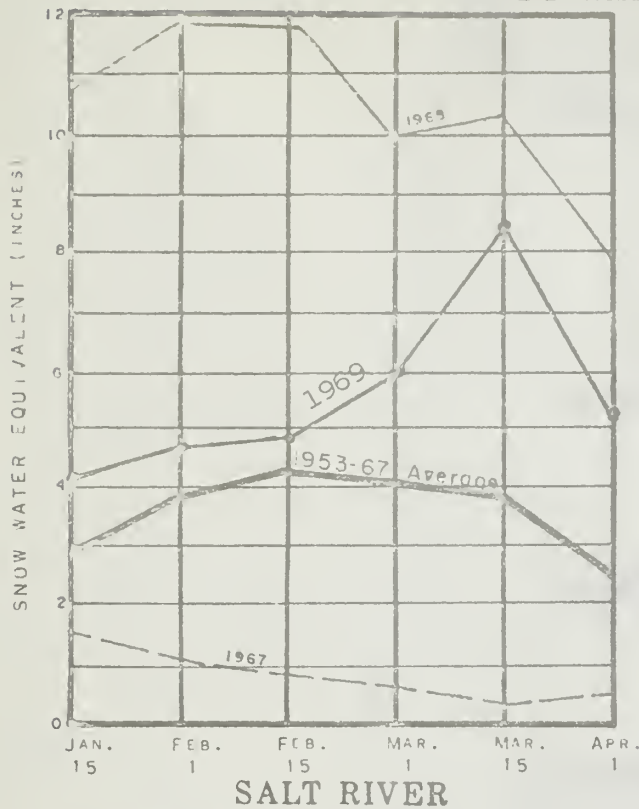
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...	...	...	...	...	...

Approved by the Department of Chemistry  
 Date \_\_\_\_\_

# 1969 ARIZONA SNOW COVER BY WATERSHEDS



# Figure 1: Four subplots showing the evolution of a system over time for different initial conditions.



(a)  $y(0) = 0$



(b)  $y(0) = 1$



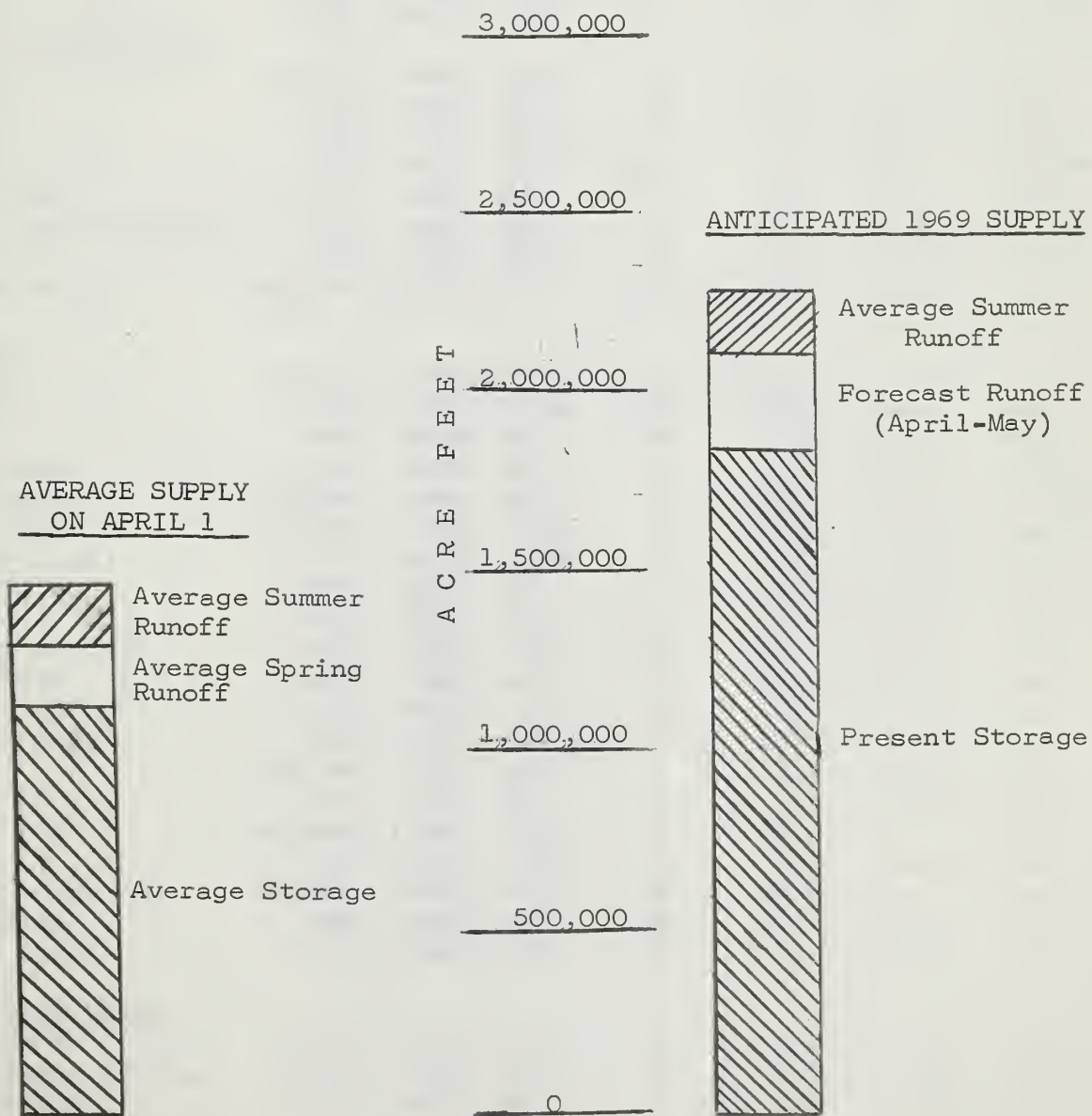
(c)  $y(0) = 2$



(d)  $y(0) = 3$

WATER SUPPLY INVENTORY  
SALT RIVER VALLEY SYSTEM

APRIL 1, 1969



\* Based on Present Storage + Forecast Spring Runoff + Average Summer Runoff





## SNOW

ABOUT APRIL 1, 1969

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH (inches)	WATER CONTENT (inches)	WATER CONTENT (inches)	
NAME	NO	ELEVATION				LAST YEAR	AVERAGE "

GILA RIVER

Bear Wallow	10T1	8100	4/1	0	0.0	10.8	2.0
Beaver Head	9S6	8000	3/29	5	1.5	9.0	1.0
Coronado Trail	9S7	8000	3/28	7	3.7	3.4	0.3
Crazy Horse (A)	9T2-A	10200	4/2	36	16.2	29.4	---
Emory Pass No. 1 *	7T1	7800	3/28	0	0.0	0.0	---
Emory Pass No. 2 *	7T2	7800	3/28	0	0.0	T	---
Frisco Divide	8S1-M	8000	3/28	1	0.4	2.7	0.4
Hannagan Meadows *	9S11	9090	3/29	41	15.1	17.4	---
High Peak (A)	9T1-A	10500	4/2	36	15.0	30.6	---
Hummingbird (A)	8S9-A	10550	4/1	50	19.0	31.1	---
Ice King	8S6	8020	3/30	17	6.2	11.5	5.7 **
Inman (discontinued)							
McKnight Cabin *	7S3-A	9300	3/28	14	4.4	9.9	---
Mogollon	8S2	7000	4/1	0	0.0	0.0	0.0
Nutrioso	9S4	8500	3/28	3	1.6	2.6	0.3
Redstone Trail	8S7	8600	3/30	22	7.6	15.0	6.8 **
Rose Canyon	10T2	7300	4/1	0	0.0	0.0	0.4
Silver Creek Divide	8S8	9000	3/30	40	14.5	21.8	10.0 **
State Line	9S8	8000	3/28	1	0.4	5.8	0.2
Whitewater (A)	8S10-A	10750	4/1	62	21.7	36.2	---

SALT RIVER

Baldy #2	9S15	9750	3/24	71	23.1	---	---
Baldy #3	9S16	10950	3/24	95	36.6	---	---
Baldy *	9S1	9125	4/1	26	9.9	12.0	5.3
Beaver Head	9S6	8000	3/29	5	1.5	9.0	1.0
Canyon Creek	10R7-M	7500	3/31	5	2.0	4.3	1.0 **
Canyon Point	10R9	7600	3/31	3	1.3	3.8	---
Coronado Trail	9S7	8000	3/28	7	3.7	3.4	0.3
Forest Dale	10R6	6430	4/1	0	0.0	0.0	0.0
Ft. Apache	9R5	9160	4/1	27	9.6	10.6	6.1
Hannagan Meadows	9S11	9090	3/29	41	15.1	17.4	---
Hawley Lake	9R10	8300	4/1	18	7.4	10.0	---
Heber	10R4	7600	3/31	6	2.6	5.1	1.1
Maverick Fork	9S2	9050	4/1	33	12.7	15.1	6.8
McNary	9R2-M	7200	4/1	1	0.4	0.6	0.3
Milk Ranch	9R1	7000	4/1	0	0.0	0.0	0.0
Mt. Ord (A)	9S12-A	11000	3/25	96	35.9	---	---
Nutrioso *	9S4	8500	3/28	3	1.6	2.6	0.3
Smith Cienega (A)	9S14-A	9850	3/25	82	31.4	---	---
Wilson Lake	9R6	9000	4/1	42	15.6	14.4	---
Workman Creek	10S1	6900	3/27	18	7.3	13.3	1.5

BILL WILLIAMS RIVER

Camp Wood *	12R1	5700	4/1	0	0.0	0.0	0.1
Copper Basin Divide	12R6	6720	4/1	0	0.0	0.0	0.0 **
Iron Springs	12R2	6200	4/1	0	0.0	0.0	0.0

(a) 1953-67, 15 year period. (\*) Adjacent drainage. (\*\*) 1953-67 Adjusted Average. (A) Aerial observation. Water content estimated.



## SNOW

ABOUT APRIL 1, 1969

DRAINAGE BASIN and SNOW COURSE			CURRENT INFORMATION			PAST RECORD	
NAME	NO.	ELEVATION	DATE OF SURVEY	SNOW DEPTH (Inches)	WATER CONTENT (Inches)	WATER CONTENT (Inches)	
						LAST YEAR	AVERAGE <sup>a</sup>

VERDE RIVER

Baker Butte	11R6	7300	3/31	14	5.8	11.8	----
Camp Wood	12R1	5700	4/1	0	0.0	0.0	0.1
Chalender	12P1-M	7100	4/1	6	2.0	0.0	0.7
Copper Basin Divide	12R6	6720	4/1	0	0.0	0.0	0.0 **
Fort Valley	11P2	7350	3/28	10	4.2	0.0	0.7
Gaddes Canyon	12R4	7600	3/31	26	10.0	8.5	2.6 **
Happy Jack	11R5	7630	4/1	9	3.5	0.6	1.2
Iron Springs *	12R2	6200	4/1	0	0.0	0.0	0.0
Mingus Mountain	12R3	7100	3/31	0	0.0	0.0	0.1
Mormon Lake *	11R4	7350	3/31	6	2.6	1.1	1.6
Mormon Mountain	11R3-M	7500	3/31	19	8.7	2.9	2.5
Newman Park	11P5-M	6750	3/31	2	0.8	0.0	0.5 **
Snow Bowl #1	11P4	10260	4/2	49	18.8	13.4	9.0 **
Snow Bowl #2	11P6	11000	4/2	83	29.1	23.6	---
White Spar	12P5	6000	4/1	0	0.0	0.0	0.0 **
White Horse Lake Jct	12P2	7150	3/31	5	2.0	1.8	---

LOWER COLORADO RIVER

Bill Williams Summit	12P4	8950	3/31	51	20.5	15.8	---
Bill " Intermediate	12P5	8550	3/31	36	14.6	11.9	---
Bright Angel	12N1	8400	NO SURVEY			---	---
Chalender *	12P1-M	7100	4/1	6	2.0	0.0	0.7
Fort Valley	11P2	7350	3/28	10	4.2	0.0	0.7
Grand Canyon	11P1	7500	REPORT DELAYED			0.0	0.4
Williams Ski Run	12P3	7720	3/31	25	9.4	14.3	---

LITTLE COLORADO RIVER

Agassiz (A)	11P10	11200	4/1	90	37.0	---	---
Baldy	9S1	9125	4/1	26	9.9	12.0	5.3
Baldy #2	9S15	9750	3/24	71	28.1	---	---
Baldy #3	9S16	10950	3/24	95	36.6	---	---
Canyon Creek	10R7-M	7500	3/31	5	2.0	4.3	1.0 **
Canyon Point	10R9	7600	3/31	3	1.3	3.8	---
Cheese Springs	9R7	8600	3/28	31	10.7	---	---
Forest Dale	10R6	6430	4/1	0	0.0	0.0	0.0
Ft. Apache	9R5	9160	4/1	27	9.6	10.6	6.1
Fort Valley	11P2	7350	3/28	10	4.2	0.0	0.7
Happy Jack *	11R5	7630	4/1	9	3.5	0.6	1.2
Heber	10R4	7600	3/31	6	2.6	5.1	1.1
Inner Basin #1	11P9	10100	4/1	70	30.0	21.4	---
Inner Basin #2	11P8	9750	4/1	42	17.6	15.4	---
Inner Basin #3	11P7	10250	4/1	40	17.1	22.0	---
McNary	9R2-M	7200	4/1	1	0.4	0.6	0.3
Mormon Lake	11R4	7350	3/31	6	2.6	1.1	1.6
Mormon Mountain	11R3-M	7500	3/31	19	8.7	2.9	2.5
Nutriosio	9S4	8500	3/28	3	1.5	2.6	0.3
Snow Bowl #1	11P4	10260	4/2	49	18.8	13.4	9.0 **
Snow Bowl #2	11P6	11000	4/2	83	29.1	23.6	---
Wilson Lake *	9R6	9000	3/28	42	15.6	14.4	---

(a) 1953-67, 15 year period. (\*) Adjacent drainage. (\*\*) 1953-67 Adjusted Average. (A) Aerial observation: Water content estimated.

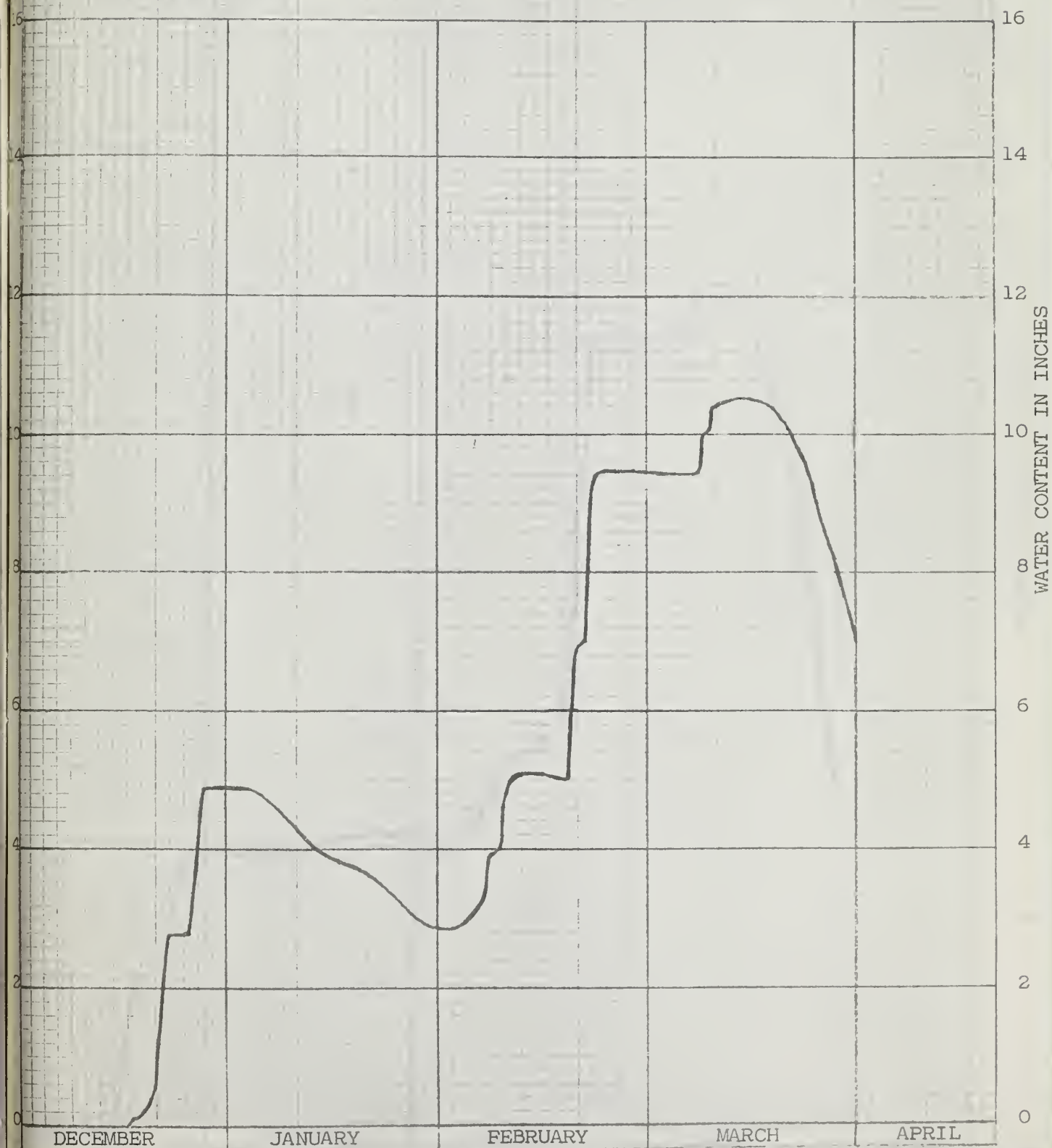




S N O W   P I L L O W   D A T A

BAKER BUTTE

Elevation: 7300

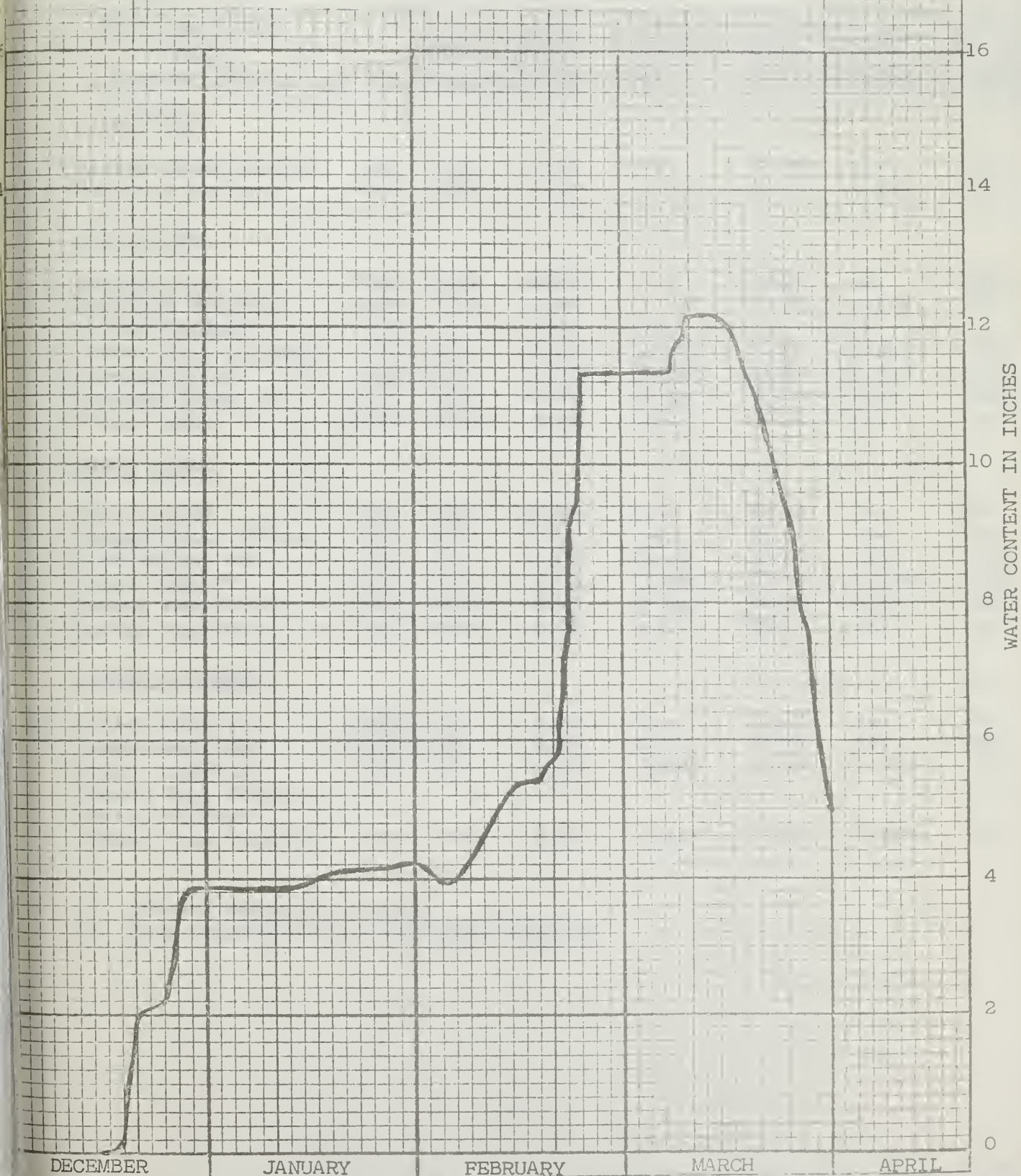




S N O W   P I L L O W   D A T A

MORMON MOUNTAIN

Elevation: 7500







# PRECIPITATION

## STORAGE GAGE DATA - ABOUT APRIL 1, 1969

Drainage Basin and Storage Gage	Elev.	Current Data Date of March Reading Precip.	1953-67 Av. March Precip.	From Approx. 11/1 to Date This 1953-67 Year Average	% of Average
<u>GILA RIVER</u>					
Silver Creek Divide	9000	3/30 3.10	---	14.94	---
Hannagan Meadows	9030	3/29 3.34	3.14*	16.38	123
<u>SALT RIVER</u>					
Canyon Point	7600	3/31 4.07	---	23.56	---
Hannagan Meadows	9030	3/29 3.34	3.14*	16.38	123
Little Wildcat (Heber Snow Course)	7600	3/31 2.92	3.15*	17.04	117
Maverick Fork	9050	4/1 1.50	2.59*	14.43	115
Workman Creek **	6970	3/27 2.35	3.38	18.63	108
Wilson Lake	9100	3/28 3.45	---	14.33	---
<u>VERDE RIVER</u>					
Baker Butte	7300	3/31 2.84	---	22.95	---
Copper Basin Divide	6720	4/1 3.00	---	16.15	---
Fort Valley **	7350	4/1 4.07	1.84	15.63	172
Happy Jack **	7480	4/1 2.71	2.42*	17.47	155
Mingus Mountain	7660	3/31 3.29	2.04	14.65	150
Mormon Mountain	7500	3/31 3.35	---	24.21	---
<u>LITTLE COLORADO</u>					
Inner Basin #1	9830	4/1 3.97	---	19.87	---
Inner Basin #2	10050	4/1 4.10	---	21.32	---
Sheep Crossing (Baldy Snow Course)	9125	4/1 2.40	2.34*	13.44	114
Little Wildcat (Heber Snow Course)	7600	3/31 2.92	3.15*	17.04	117

\* 1953-67 Adjusted Average

\*\* Data Supplied by U. S. Forest Service



# Appendix

## List of Abbreviations

The following abbreviations are used in the text of this report. The full name of each organization or institution is given in the list below.

Abbreviations are given in the following order: (1) the name of the organization or institution; (2) the name of the project or program; (3) the name of the individual or organization responsible for the project or program.

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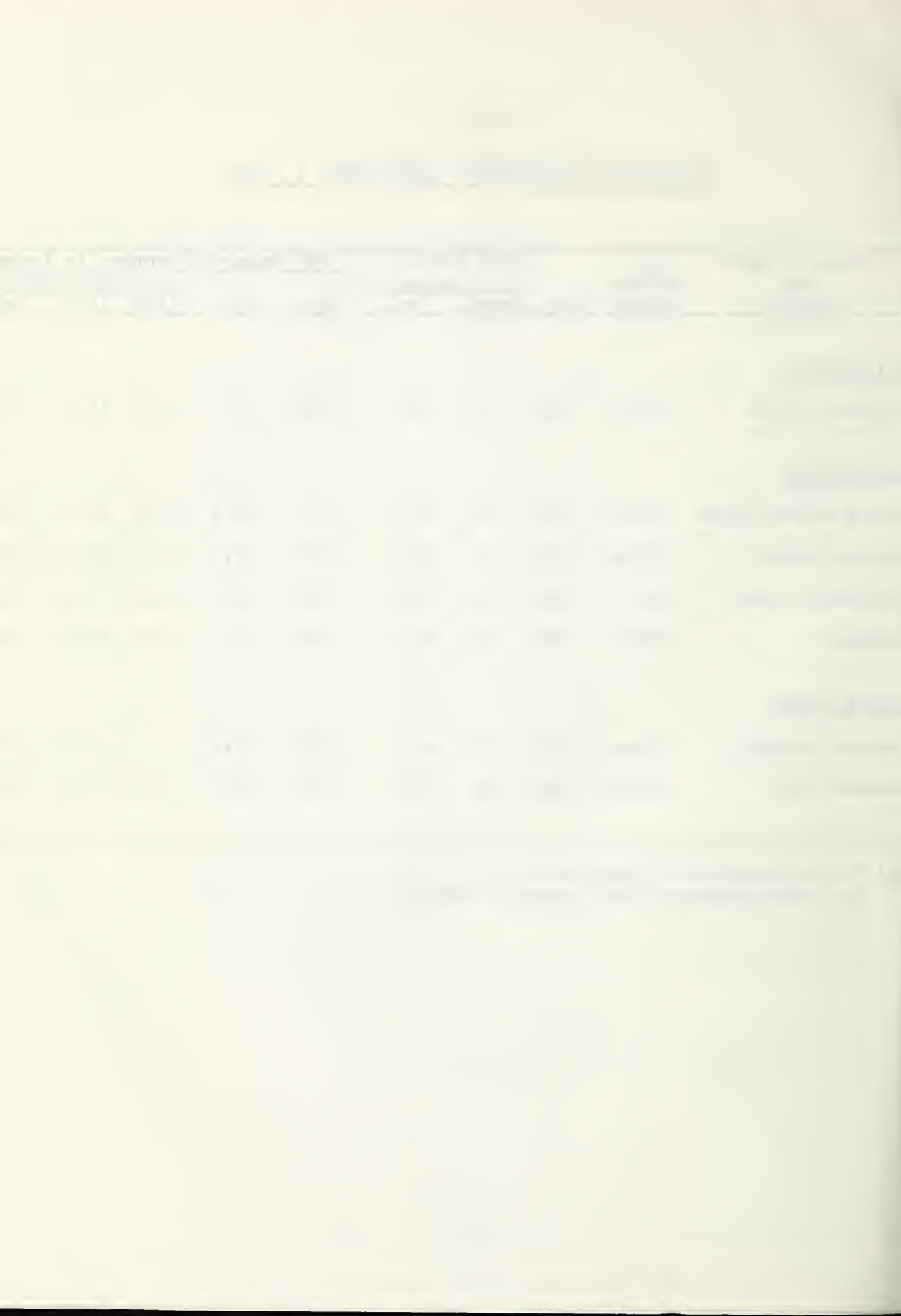
Prepared by the  
National Science Foundation

ARIZONA SOIL MOISTURE - ABOUT APRIL 1, 1969

Drainage Basin and Station	1/ Station Number	Elev.	Soil Profile in Inches		Date	Soil Moisture Content in Inches			
			Depth	Cap.		1969	Past Record		Avg.
							1968	1967	
<u>GILA RIVER</u>									
Frisco Divide	8S1-M	8000	48	13.3	3/28	12.2	13.8	11.2	11.8
<u>SALT RIVER</u>									
Black River Divide	9S10-*	9100	48	16.8	4/1	18.4	18.1	17.9	16.3
Canyon Creek	10R7-M	7500	48	18.3	3/31	17.8	17.6	18.8	15.3
Corduroy Creek	10R8-*	6000	36	13.5	3/26	14.0	14.9	9.8	9.2
McNary	9R2-M	7200	48	16.3	3/28	18.0	17.9	16.0	15.4
<u>VERDE RIVER</u>									
Mormon Mountain	11R3-M	7500	48	16.1	3/31	17.8	17.7	17.8	16.6
Newman Park	11P5-M	6750	48	17.7	3/31	21.6	19.5	19.5	17.9

1/ \* - Soil Moisture Station Only

M - Snow Course and Soil Moisture Station



## SNOW COURSE

Agassiz  
Baker Butte  
Baldy  
Bear Wallow  
Beaver Head  
Bill Williams Intermediate  
Bill Williams Summit  
Bright Angel  
Camp Wood  
Canyon Creek  
Canyon Point  
Chalender  
Cheese Springs  
Copper Basin Divide  
Coronado Trail  
Crazy Horse  
Emory Pass #1 and #2  
Forest Dale  
Ft. Apache  
Fort Valley  
Frisco Divide  
Gaddes Canyon  
Grand Canyon  
Hannagan Meadows  
Happy Jack  
Hawley Lake  
Heber  
High Peak  
Hummingbird  
Ice King  
Inner Basin #1, #2, #3  
Iron Springs  
Maverick Fork  
McKnight Cabin  
McNary  
Milk Ranch  
Mingus Mountain  
Mogollon  
Mormon Lake  
Mormon Mountain  
Mt. Ord  
Munds Park  
Newman Park  
Nutrioso  
Redstone Trail  
Rose Canyon  
Silver Creek Divide  
Smith Cienega  
Snow Bowl #1  
Snow Bowl #2  
State Line  
White Horse Lake Junction  
White Spar  
Whitewater  
Williams Ski Run  
Wilson Lake  
Workman Creek

## SNOW SURVEYOR

SCS & USBR - Jack Jorgensen and Sid Saunders  
SCS  
SCS - Bill Cole  
Forest Service - Carl Sollers  
N. A. Josh  
Forest Service - Robert Wagenfehr  
Forest Service - Robert Wagenfehr  
National Park Service - Charles Sigler, Dist. Rgr.  
Forest Service - Walter G. Richardson  
SCS  
SCS  
Forest Service - M. E. Richards  
SCS - Bill Cole  
SCS - Bill Gray  
Forest Service - John W. Holt  
Forest Service - Loyd Barnett  
SCS - T. Stevenson and J. Powell  
Bureau of Indian Affairs - Raymond Endfield  
SCS - Bill Cole  
Rocky Mountain Forest & Range Exp. Station  
Forest Service - Luna District Ranger  
Paul G. Lidbeck  
National Park Service - Robert E. Scott, Dist. Rgr.  
N. A. Josh  
Forest Service - Don W. Witt  
Bureau of Indian Affairs - Raymond Endfield  
SCS  
Forest Service - Loyd Barnett  
Ray Freeman  
James R. Wray  
SCS and USBR - Jack Jorgensen and Sid Saunders  
SCS - Bill Gray  
SCS - Bill Cole  
Ray Freeman  
Bureau of Indian Affairs - Raymond Endfield  
Bureau of Indian Affairs - Raymond Endfield  
Paul G. Lidbeck  
James R. Wray  
SCS - Jack Jorgensen  
SCS - Jack Jorgensen  
Salt River Project  
SCS - Jack Jorgensen  
SCS - Jack Jorgensen  
Forest Service - John W. Holt  
James R. Wray  
Forest Service - Carl Sollers  
James R. Wray  
Salt River Project  
Forest Service - Angus Porter  
Forest Service - Angus Porter  
Forest Service - Luna District Ranger  
Forest Service - Robert Wagenfehr  
SCS - Bill Gray  
Ray Freeman  
Forest Service - Robert Wagenfehr  
SCS - Bill Cole  
Rocky Mountain Forest & Range Exp. Station





# The Following Organizations Cooperate in the Arizona Snow Survey Work

## FEDERAL

Department of Agriculture

Soil Conservation Service

Forest Service

Apache Forest

Coconino Forest

Caronado Forest

Gila Forest

Kaibab Forest

Prescott Forest

Rocky Mountain Forest and Range Experiment Station

Tonto Forest

Department of Commerce

Weather Bureau

Arizona Section

Department of Interior

Bureau of Reclamation

Region III

Geological Survey

Arizona District

Bureau of Indian Affairs

Fort Apache Reservation

San Carlos Irrigation Project

National Park Service

Grand Canyon National Park

Gila Water Commissioner

Safford, Arizona

## STATE

University of Arizona

Arizona Agricultural Experiment Station

Water Resource Research Center

## IRRIGATION PROJECTS

Salt River Valley Water Users' Association

Phoenix, Arizona

San Carlos Irrigation and Drainage District

Coolidge, Arizona

## PRIVATE

Southwest Forest Industries, Inc.

McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

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SOIL CONSERVATION SERVICE  
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with the Snow Survey"*